



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/764,454 | 01/27/2004 | Tatsuhiko Saitoh | 50395-247 | 8678 |

7590 08/08/2007
McDERMOTT, WILL & EMERY
600 13th Street, N.W.
Washington, DC 20005-3096

| |
|----------|
| EXAMINER |
|----------|

DEGHAN, QUEENIE S

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

1731

| | |
|-----------|---------------|
| MAIL DATE | DELIVERY MODE |
|-----------|---------------|

08/08/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | | |
|------------------------------|------------------------|--|---------------------|--|
| Office Action Summary | Application No. | | Applicant(s) | |
| | 10/764,454 | | SAITOH ET AL. | |
| | Examiner | | Art Unit | |
| | Queenie Dehghan | | 1731 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 May 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in-condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1 to 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arimondi et al. (2005/0072192) in view of Nagayama et al. (2002/0059816 and 6,400,878) and Caplen et al. (2003/0089133). Regarding claims 1 and 2, Arimondi et al. disclose a method for preparing an optical fiber perform having through holes to be formed into air holes and drawing the optical fiber perform into a fiber with the air holes ([0001], [0005], [0026], figure 1). However, Arimondi et al. do not disclose a third step of heated the optical fiber in an additional furnace. Nagayama et al. (878) teach of a step of heating the optical fiber to a temperature of 1100°C for 3 seconds (col. 12 lines

Art Unit: 1731

64-67) in an additional heating furnace located downstream of a drawing furnace (col. 5 lines 46-48). The annealing would prevent the drawn fiber from cooling drastically and hence suppress the Rayleigh scattering intensity within the optical fiber (col. 1 lines 32-39, col. 2 lines 47-52). It would have been obvious to one of ordinary skill in the art at the time the invention was made to heat the fiber to 1100°C for 3 seconds in an additional furnace, as taught by Nagayama et al, in the fiber drawing process of Arimondi et al. in order to ensure proper annealing, as taught by Nagayama et al. Furthermore, although Arimondi et al. disclose pumping a hydrogen free gas into the through holes of the preform during drawing ([0115]), Arimondi et al. fail to specifically disclose the presence of oxygen gas in the through holes when drawing the optical fiber preform. Caplen et al. teach filling a hole in an optical fiber preform with gases, such as oxygen and drawing the preform with oxygen filled holes ([0044], [0045]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the dry oxygen of Caplen et al. in holes of Arimondi et al. in order to keep the hole dry and to prevent contamination of the holes during drawing of the preform, as taught by Caplen et al.

4. Regarding claims 3 and 4, Arimondi et al. do not disclose a minimum temperature of the fiber between the drawing and heating furnaces. Nagayama et al. (816) teach the use of two furnaces, a drawing and heating furnace, for forming an optical fiber, where an optical fiber usually cools to about 400°C after being drawn ([0010]). Furthermore, Nagayama et al. teach cooling the fiber with air between the drawing and heating furnaces ([0058]). It would have been obvious to one of ordinary

Art Unit: 1731

skill in the art at the time the invention was made to heat the fiber to 1100°C as mentioned in claim 1, which is higher than the air-cooled down temperature of 400°C, as disclosed by Nagayama et al. in order to properly anneal the fiber.

5. Regarding claims 5 and 6, Nagayama et al. (816) teach of a drawing furnace filled with helium gas and a heating furnace filled with nitrogen gas ([0058], [0063]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use helium gas in the drawing furnace and nitrogen gas in the heating furnace, as taught by Nagayama et al. in the drawing process of Arimondi et al. and Nagayama et al. (878), in order to provide the atmospheres needed to soften and anneal the glass fiber with a lowered transmission loss and whose outer diameter is restrained from fluctuating, as taught by Nagayama et al.

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arimondi et al. (2005/0072192) in view of Nagayama et al. (6,400,878) and Caplen et al. (2003/0089133); as applied to claim 1 above, and further in view of Kuwahara et al. (2002/0174692). Arimondi and Nagayama do not disclose a drawing temperature. Kuwahara et al. teach of drawing step at 1950°C. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilized the drawing temperature of Kuwahara et al. in the fiber making process of Arimondi et al. and Nagayama et al. in order to properly soften the glass for drawing.

Response to Arguments

7. Applicant's arguments filed May 14, 2007 have been fully considered but they are not persuasive.

8. The applicant argues that Caplen uses oxygen when an etching gas is used. Furthermore, applicant points out that the "inner surfaces of holes must kept smooth in order to suppress an occurrence of Rayleigh scattering" and thus etching is not done in the present invention. It is believed that the applicant has misread the prior art and interpreted "etching" to indicate the removal of the glass, resulting in a non-smooth surface of the holes. Instead, Caplen's use of oxygen and a drying gas such as chlorine is for the etching or removal of contaminants and not the surface of the holes, as disclosed by Caplen. The use of chlorine and oxygen gases to remove contaminants from surfaces of the optical preform for a holey fiber is exemplified by others in the art as well, such as Fekety et al. (6,917,741). In col. 8 lines 10-37, Fekety teaches a holey fiber preform, where chlorine and oxygen gases to remove organic contaminants on the surfaces of the preform in order to lower the level of attenuation of the drawn fiber. Therefore, the etching or removal of contaminants as disclosed by Caplen would result in smooth surfaces of the holes, as desired by the applicant. Furthermore, the applicant amended claim 1 to include the suppression of Rayleigh scattering. Contrary to the applicant's argument, this amendment does not clarify the absence of etching.

9. The applicant argues that there was a lack of realistic motivation has not been established and that the reference or Arimondi failed to envision the problem addressed and solved by the applicant. This is incorrect in that Nagayama et al. discloses the

Art Unit: 1731

same concern of transmission losses due to Rayleigh scattering and proposes a similar solution as the applicant, that is an additional heating furnace that promotes the suppression of Rayleigh scattering in the optical fiber drawn. Furthermore, Caplen et al. teaches the need for removal or etching away of contaminants in the through hole of the optical fiber preform, which is a similar concern of the applicant, where SiO₂ contaminants are oxidized.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Queenie Dehghan whose telephone number is

Art Unit: 1731

(571)272-8209. The examiner can normally be reached on Monday through Friday
8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



STEVEN P. GRIFFIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

Q Dehghan